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Removing cyanide(s) from industrial process water used in persipan manufacture from apricot stone kernels - by gas stripping, alkaline scrubbing of gas and two stage oxidation to nitrogen and carbon di:oxide with fluids recirculation

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Addnl. Data: THELITZ A, MUELLER-KUHRT L

D(3-J, 4-A2, 4-B7A) E(10-D1D, 11-Q2, 31-E, 32-B) J(1-E2A1)

The method of removing cyanides from industrial process water, recirculated between process (1) and ~~cyanide removal~~ (3) plants, comprises physically pretreating the water as necessary, before contacting with gas in a stripping column (3). The gas is enriched in cyanide, and as required, the process water is repeatedly recirculated through a subcircuit to physical pretreatment and/or stripping.

Also claimed is the plant to carry out the process, essentially as described.

USE

Used for removing cyanide from industrial process water, especially in the food industry in the manufacture of persipan, a marzipan-type product, made from the stone kernels of apricots by a bitters-removal process (claimed).

ADVANTAGE

The method offers a simple, cost effective removal of cyanide from process water. Reduced quantities of waste water and off-gases are to be expected, in comparison with the prior art. It is particularly suitable for use in persipan manufacture. Repeated recirculation, stripping and solids removal contribute to water economy and rapid removal of the cyanide. The water can be put to renewed use. Less than 20 mg/l of CN^- can be achieved rapidly, during stripping. A great improvement on existing processes is claimed. Alkali recirculation in the process also minimises effluent.

PREFERRED CYANIDE REMOVAL PROCESS

Cyanide-laden stripping gas passes to a stage of cyanide destruction. The stripping gas is air, carbon dioxide and/or nitrogen, preferably compressed air. Physical pretreatment of the process water

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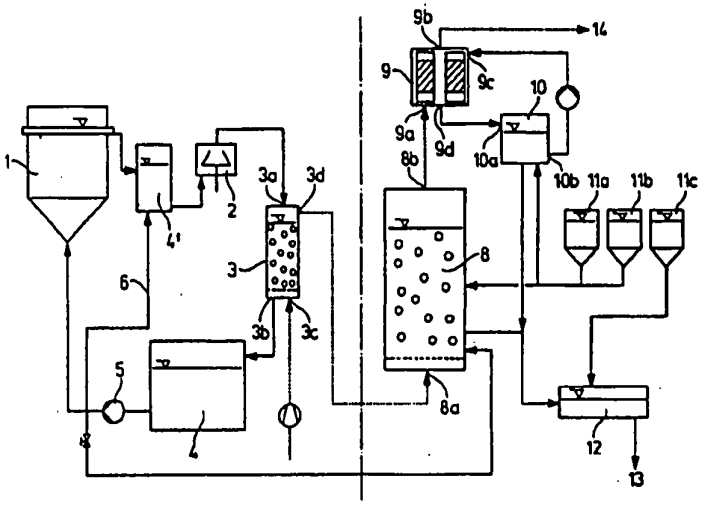
comprises one or more of; centrifugation (2) to remove solids; filtration, preferably micro, ultra and/or nano-filtration; or UV-irradiation for sterilisation. Cyanide destruction is carried out in three stages; alkaline scrubbing of the stripping gas, preferably using sodium hydroxide solution; treating the cyanide concentrated in alkali with hydrogen peroxide under basic conditions; finally oxidation of the treated cyanide to nitrogen and carbon dioxide. This oxidation is achieved by addition of hydrogen peroxide and/or monopersulphate with initial reaction taking plane under basic conditions and/or by addition of ozone. The second (basic H_2O_2) stage takes place at a pH greater than 10. The third stage takes place at a pH value of 5-6.5, preferably 6. Oxidation with hydrogen peroxide in the second and third stages is supported by irradiation with ultraviolet light. Alkaline wash liquor is recirculated. Cyanide destruction is effected by catalytic oxidation, preferably on copper or activated carbon using oxygen. The cyanide may be destroyed by conversion with aldehydes, preferably formaldehyde in conjunction with hydrolysis, preferably with hydrogen peroxide addition. The stripping gas, following single or multiple passes through the stripping column (3) is passed through a second cyanide-loaded fluid (8), extracting further cyanide, where, if appropriate, further fresh stripping gas is used in addition. The second fluid is cleaned until sufficient chemical oxidation of residual cyanide allows it to be introduced into the waste water. The second fluid may be consigned to disposed process water from the circuit following the first stage.



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